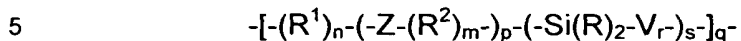


WHAT IS CLAIMED IS:

1. A medical device comprising a polymer comprising a group of the formula:



wherein:

n = 0 or 1;

m = 0 or 1;

10 p = 1-100,000;

r = 0-100,000;

s = 1-100,000;

q = 1-100,000;

15 R¹ and R² are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

20 Z is -C(R³)₂- wherein each R³ is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R³ groups within -C(R³)₂- can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

25 V is -O-Si(R)₂- or R¹.

2. The medical device of claim 1 wherein p = 1-5000.

3. The medical device of claim 2 wherein p = 2-12.

30

4. The medical device of claim 1 wherein R¹ and R² are each independently a straight chain alkylene group, an arylene group, or combinations thereof.

5. The medical device of claim 4 wherein R^1 and R^2 are each independently a straight chain alkylene group.
6. The medical device of claim 1 wherein R^1 and R^2 are each independently groups containing up to 100 carbon atoms.
7. The medical device of claim 6 wherein R^1 and R^2 are each independently groups containing up to 20 carbon atoms.
8. The medical device of claim 7 wherein R^1 and R^2 are each independently groups containing 2 to 20 carbon atoms.
9. The medical device of claim 1 wherein each R^3 is independently a straight chain alkyl group, an aryl group, or combinations thereof, optionally including heteroatoms.
10. The medical device of claim 9 wherein each R^3 is independently a straight chain alkyl group, optionally including heteroatoms.
11. The medical device of claim 10 wherein each R^3 is independently a straight chain alkyl group containing 1 to 20 carbon atoms.
12. The medical device of claim 1 wherein the polymer further comprises a urethane group, a urea group, or combinations thereof.
13. The medical device of claim 12 wherein the polymer comprises a segmented polyurethane.
14. The medical device of claim 1 wherein the polymer is a biomaterial.
15. The medical device of claim 14 wherein the polymer is substantially free of ether, ester, and carbonate linkages.

16. The medical device of claim 1 wherein the polymer is linear, branched, or crosslinked.
17. A medical device comprising a polymer prepared from a
 5 compound of the formula:

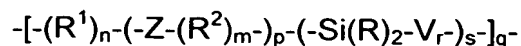
$$Y-[-(R^1)_n-(-Z-(R^2)_{m-})_p-(-Si(R)_2-V_r-)_{s-}]_q-R^5-Y$$

 wherein:
 each Y is independently OH or NR^4H ;
 $n = 0$ or 1 ;
 10 $m = 0$ or 1 ;
 $p = 1-100,000$;
 $r = 0-100,000$;
 $s = 1-100,000$;
 $q = 1-100,000$;
 15 R^1 , R^2 , and R^5 are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;
 Z is $-C(R^3)_2-$ wherein each R^3 is independently a saturated or unsaturated aliphatic group, an aromatic group, or
 20 combinations thereof, optionally including heteroatoms, wherein the two R^3 groups within $-C(R^3)_2-$ can be optionally joined to form a ring;
 each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof,
 25 optionally including heteroatoms;
 each R^4 is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof; and
 V is $-O-Si(R)_2-$ or R^1 .
- 30 18. The medical device of claim 17 wherein $p = 1-100$.
19. The medical device of claim 18 wherein $p = 2-12$.

20. The medical device of claim 17 wherein the number average molecular weight of the compound of the formula $Y-[-(R^1)_n-(-Z-(R^2)_m)_p-(-Si(R)_2-V_r)_s-]_q-R^5-Y$ is no greater than about 100,000 grams/mole.
- 5 21. The medical device of claim 20 wherein the number average molecular weight of the compound of the formula $Y-[-(R^1)_n-(-Z-(R^2)_m)_p-(-Si(R)_2-V_r)_s-]_q-R^5-Y$ is about 1000 grams/mole to about 1500 grams/mole.
- 10 22. The medical device of claim 17 wherein R^1 and R^2 are each independently a straight chain alkylene group, an arylene group, or combinations thereof.
23. The medical device of claim 22 wherein R^1 and R^2 are each
15 independently a straight chain alkylene group.
24. The medical device of claim 17 wherein R^1 and R^2 are each independently groups containing up to 100 carbon atoms.
- 20 25. The medical device of claim 24 wherein R^1 and R^2 are each independently groups containing up to 20 carbon atoms.
26. The medical device of claim 25 wherein R^1 and R^2 are each
25 independently groups containing 2 to 20 carbon atoms.
27. The medical device of claim 17 wherein each R^2 includes at least two carbon atoms.
28. The medical device of claim 17 wherein each R^3 is independently
30 a straight chain alkyl group, an aryl group, or combinations thereof, optionally including heteroatoms.

29. The medical device of claim 28 wherein each R^3 is independently a straight chain alkyl group, optionally including heteroatoms.
30. The medical device of claim 29 wherein each R^3 is independently
5 a straight chain alkyl group containing 1 to 20 carbon atoms.
31. The medical device of claim 17 wherein the polymer further comprises a urethane group, a urea group, or combinations thereof.
- 10 32. The medical device of claim 31 wherein the polymer comprises a segmented polyurethane.
33. The medical device of claim 17 wherein the polymer is a biomaterial.
15
34. The medical device of claim 33 wherein the polymer is substantially free of ether, ester, and carbonate linkages.
35. The medical device of claim 17 wherein each Y is OH.
20
36. The medical device of claim 17 wherein each R^4 is independently H or a straight chain alkyl group.
37. The medical device of claim 36 wherein each R^4 is independently
25 a straight chain alkyl group containing 1 to 20 carbon atoms.
38. The medical device of claim 36 wherein each R^4 is H.
39. The medical device of claim 17 wherein the polymer is linear,
30 branched, or crosslinked.

40. A polymer comprising a group of the formula:



5 wherein:

n = 0 or 1;

m = 0 or 1;

p = 1-100,000;

r = 0-100,000;

10 s = 1-100,000;

q = 1-100,000;

R¹ and R² are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

15 Z is -C(R³)₂- wherein each R³ is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R³ groups within -C(R³)₂- can be optionally joined to form a ring;

20 each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

V is -O-Si(R)₂- or R¹.

25 41. The polymer of claim 40 wherein p = 1-5000.

42. The polymer of claim 40 wherein p = 2-12.

43. The polymer of claim 40 wherein R¹ and R² are each
30 independently a straight chain alkylene group, an arylene group, or combinations thereof.

44. The polymer of claim 43 wherein R¹ and R² are each independently a straight chain alkylene group.

45. The polymer of claim 40 wherein R¹ and R² are each independently groups containing 2 to 20 carbon atoms.

46. The polymer of claim 40 wherein each R³ is independently a straight chain alkyl group, an aryl group, or combinations thereof, optionally including heteroatoms.

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47. The polymer of claim 46 wherein each R³ is independently a straight chain alkyl group, optionally including heteroatoms.

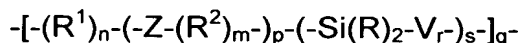
48. The polymer of claim 47 wherein each R³ is independently a straight chain alkyl group containing 1 to 20 carbon atoms.

15

49. The polymer of claim 40 which is linear, branched, or crosslinked.

50. A polymer comprising a urethane group, a urea group, or combinations thereof, and a group of the formula:

20



wherein:

25

n = 0 or 1;

m = 0 or 1;

p = 1-100,000;

r = 0-100,000;

s = 1-100,000;

30

q = 1-100,000;

R¹ and R² are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

Z is $-C(R^3)_2-$ wherein each R^3 is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R^3 groups within $-C(R^3)_2-$ can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

V is $-O-Si(R)_2-$ or R^1 .

10

51. The polymer of claim 50 wherein $p = 1-100$.

52. The polymer of claim 51 wherein $p = 2-12$.

15 53. The polymer of claim 50 which is a segmented polyurethane.

54. The polymer of claim 50 which is a biomaterial.

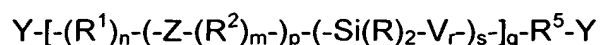
55. The polymer of claim 54 which is substantially free of ether, ester, and carbonate linkages.

20

56. The polymer of claim 50 which is linear, branched, or crosslinked.

57. A polymer prepared from a compound of the formula:

25



wherein:

each Y is independently OH or NR^4H ;

30

$n = 0$ or 1 ;

$m = 0$ or 1 ;

$p = 1-100,000$;

$r = 0-100,000$;

s = 1-100,000;

q = 1-100,000;

R¹, R², and R⁵ are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

Z is -C(R³)₂- wherein each R³ is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R³ groups within -C(R³)₂- can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

each R⁴ is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof; and

V is -O-Si(R)₂- or R¹.

58. The polymer of claim 57 wherein p = 1-100.

59. The polymer of claim 58 wherein p = 2-12.

60. The polymer of claim 57 wherein the number average molecular weight of the compound of the formula

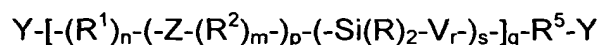
Y-[(R¹)_n-(-Z-(R²)_m)-(-Si(R)₂-V)-]_q-R⁵-Y is no greater than about

100,000 grams/mole.

61. The polymer of claim 57 wherein R¹ and R² are each independently a straight chain alkylene group, an arylene group, or combinations thereof.

62. The polymer of claim 61 wherein R¹ and R² are each independently groups containing up to 100 carbon atoms.

63. The polymer of claim 62 wherein R^1 and R^2 are each independently groups containing up to 20 carbon atoms.
64. The polymer of claim 63 wherein R^1 and R^2 are each independently groups containing 2 to 20 carbon atoms.
65. The polymer of claim 57 wherein each R^2 includes at least two carbon atoms.
66. The polymer of claim 57 wherein each R^3 is independently a straight chain alkyl group, an aryl group, or combinations thereof, optionally including heteroatoms.
67. The polymer of claim 66 wherein each R^3 is independently a straight chain alkyl group containing 1 to 20 carbon atoms.
68. The polymer of claim 57 wherein each Y is OH.
69. The polymer of claim 57 wherein each R^4 is independently H or a straight chain alkyl group.
70. The polymer of claim 57 which is linear, branched, or crosslinked.
71. A compound of the formula:



wherein:

each Y is independently OH or NR^4H ;

$n = 0$ or 1 ;

$m = 0$ or 1 ;

$p = 1-100,000$;

$r = 0-100,000$;

s = 1-100,000;

q = 1-100,000;

R¹, R², and R⁵ are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

Z is -C(R³)₂- wherein each R³ is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R³ groups within -C(R³)₂- can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

each R⁴ is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof; and

V is -O-Si(R)₂- or R¹.

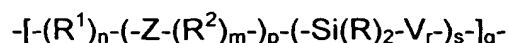
72. The compound of claim 71 wherein R¹ and R² are each independently a straight chain alkylene group, an arylene group, or combinations thereof.

73. The compound of claim 72 wherein R¹ and R² are each independently groups containing up to 100 carbon atoms.

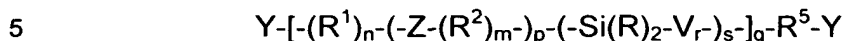
74. The compound of claim 72 wherein each R³ is independently a straight chain alkyl group, an aryl group, or combinations thereof, optionally including heteroatoms.

75. The compound of claim 72 wherein each Y is OH.

76. A method of making a polymer comprising a group of the formula



the method comprising combining an organic compound containing two or more groups capable of reacting with hydroxyl or amine groups with a polymeric starting compound of the formula:



wherein:

each Y is independently OH or NR^4H ;

$n = 0$ or 1 ;

10 $m = 0$ or 1 ;

$p = 1-100,000$;

$r = 0-100,000$;

$s = 1-100,000$;

$q = 1-100,000$;

15 R^1 , R^2 , and R^5 are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

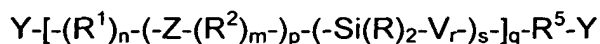
Z is $-C(R^3)_2-$ wherein each R^3 is independently a saturated or unsaturated aliphatic group, an aromatic group, or
20 combinations thereof, optionally including heteroatoms, wherein the two R^3 groups within $-C(R^3)_2-$ can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof,
25 optionally including heteroatoms;

each R^4 is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof; and

V is $-O-Si(R)_2-$ or R^1 .

30 77. A method of making a compound of the formula:



wherein:

each Y is independently OH or NR⁴H;

n = 0 or 1;

m = 0 or 1;

5 p = 1-100,000;

r = 0-100,000;

s = 1-100,000;

q = 1-100,000;

10 R¹, R², and R⁵ are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

Z is -C(R³)₂- wherein each R³ is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein
15 the two R³ groups within -C(R³)₂- can be optionally joined to form a ring;

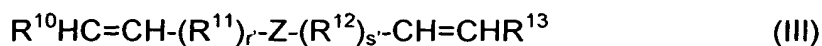
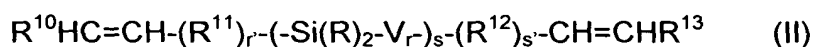
each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

20 each R⁴ is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof; and

V is -O-Si(R)₂- or R¹;

the method comprising combining monomers of Formula II or
Formula III

25



30

wherein:

r, s, V, Z, and R are as defined above;

r' = 0 or 1;

s' = 0 or 1;

R^{10} and R^{13} are each independently hydrogen or straight chain, branched, or cyclic alkyl groups containing up to 6 carbon atoms; and

5 R^{11} and R^{12} are each independently a saturated aliphatic group, an aromatic group, or combinations thereof;

with an alkene metathesis catalyst and optionally applying a vacuum.

10